
UTAH DEPARTMENT OF TRANSPORTATION

TECHNICAL BULLETIN MT-05.07

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Selecting and Using Asphalt Pavement Rejuvenating Agents

ASPHALT EMULSIONS-STANDARD

SS-1, SS-1h, CSS-1, CSS-1h are emulsified blends of petroleum asphalt cement and water which are designed for tack-coat applications but can also be used as a fog seal. The cured

residue functions as a surface preservative sealer. Apply to dry, weathered and/or raveled pavement surfaces. No softening or rejuvenating effects are imparted to pavement surfaces. Do not apply on rutted, flushed, glazed, or skin-patched pavement surfaces. Normally diluted one part emulsion to one part water and sprayed at a rate of 0.1 to 0.15 gallons per square yard (gsy) to porous, open-graded pavement surfaces or diluted two parts emulsions to one part water, at a rate of 0.1 to 0.12 gsy to aged chip-sealed pavement surfaces. Allow the application to cure before opening to traffic.

Application of emulsions to the pavement surface may cause traffic hazards. See and note the listed precautions.

TYPE A REJUVENATING AGENT

Type A is an emulsified blend of RA-1 (ASTM designated recycling agent, grade 1 naphthenic base oil) and water. The cured residue functions as a surface rejuvenator and is designed to be totally absorbed into the pavement surface. Require a manufacturer's representative to be on the job site prior to and during the initial application of Type A Rejuvenating Agent. Apply on low to moderate volume, rural pavements as a preservative agent or to rejuvenate weathered pavement surfaces with large amount of small cracks (less than 1/8" in width). Do not apply the product on rutted, flushed, glazed, or skin-patched areas. Normally diluted 2 parts emulsion to 1 part water, or 1 part emulsion to 1 part water and sprayed at an optimal rate determined by a "field absorption test". Allow the application to cure before opening to traffic..

TYPE B REJUVENATING AGENT

Type B is an emulsified blend of RA-1 (ASTM designated recycling agent, grade 1 naphthenic base oil), and petroleum asphalt. The cured residue functions as a surface rejuvenation/preservative sealer. Apply to weathered pavement surfaces, pavements with large areas of small cracks (less than 1/8" in width) and/or on raveled surfaces. Do not apply the product on rutted, flushed, glazed, or skin-patched areas, or when rain is anticipated within two weeks after application. (The residue on freshly sprayed surfaces may re-emulsify during rainfall and traffic action within the first two weeks.) Normally diluted 2:1 or 1:1 and sprayed at an optimal rate determined by a "field absorption" test. Allow the application to cure before opening to traffic.

TYPE B MODIFIED REJUVENATING AGENT

Type B Modified Agent is an emulsified blend of RA-1 naphthenic base oil, petroleum asphalt, and a minimum of 15% Gilsonite (a naturally occurring, semi-solid hydrocarbon exhibiting a high softening points). The cured residue is less tacky than type B, functions as a surface rejuvenation/preservative sealer, and is less susceptible to re-emulsification than type B. Apply on newer (older than 3 years) pavement surfaces to retard age hardening, raveling and to seal small cracks. Do not apply the product on rutted, flushed, glazed, or skin-patched pavement surfaces. Normally diluted 2 parts emulsion to 1 part water or 1



part emulsion to 1 part water and sprayed at an optimal rate determined by a “field absorption” test. Allow the application to cure before opening to traffic.

TYPE C REJUVENATING AGENT

Type C is an emulsified blend of petroleum asphalt, Tall oil pitch, and a minimum of 10% Gilsonite. The cured base asphalt is harder than Type B Modified and functions as a surface sealer. Apply on newer (older than 3 years) pavement surfaces to retard age hardening, raveling and to seal small cracks. Do not apply the product on rutted, flushed, glazed, or skin-patched pavement surfaces. Type B Modified is normally diluted 2 parts emulsion to 1 part water or 1 part emulsion to 1 part water and sprayed at an optimal rate determined by a “field absorption” test. Allow the application to cure before opening to traffic.

TYPE D REJUVENATING AGENT

Type D Modified Agent is an emulsified blend of RA-1 naphthenic base oil, petroleum asphalt, and polymer. Apply to pavement surfaces as a rejuvenating/preservative seal to retard age hardening, prevent, and/or retard raveling and to seal/heal small cracks. Do not apply the product on rutted, flushed, glazed, or skin-patched pavement surfaces. Type D is normally diluted 1 part emulsion to 1 part water and sprayed at an optimal rate determined by a “field absorption” test. Allow the application to cure before opening to traffic.

PRECAUTIONS

- Application of emulsions to a pavement surface may cause traffic hazards.
- Determine the optimal starting rate by using UDOT MOI 8-972 “Method of Test for Determining the Quantity and Rate of Absorption of Asphalt Pavement Rejuvenating Agents”.
- Application rates are based on known dilution ratios, i.e., 2 parts emulsion to 1 part water or 1 part emulsion to 1 part water.
- The effect of rejuvenating/preservative seal applications on pavement friction depends on the condition and surface texture of the pavement prior to treatment. If a slippery condition is found after the application of these agents, apply a sufficient amount of sand to reduce potential skidding to a minimum.

FURTHER INFORMATION

UDOT Standard Specification 02745, <http://www.udot.utah.gov/index.php/m=c/tid=1100>

UDOT Special Provision 02745S for a Type A Rejuvenating Agent.

UDOT Minimum Sampling and Testing Guide, Materials Manual of Instruction Part 8-972

ASPHALT INSTITUTE MANUAL SERIES No.19, “A Basic Emulsion Manual”

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